



## COVID-19 Impacts on Vaccines, Diagnostics, and Therapeutics:

### Invest in development and improved access to vaccines, therapeutics, and diagnostics for better prevention efforts, treatment, and detection

The COVID-19 pandemic highlighted the need to stop the spread of germs before they can cause an infection. Developing therapeutic and preventive products requires dedicated resources and policies to support research, turn discoveries into products, collect data for drug approval, facilitate clinical trials, and conduct post market evaluations on impact.

Vaccines can significantly reduce infection rates, which decreases antibiotic use and the number of resistant germs. For example, drug-resistant *S. pneumoniae* is one of the only germs listed in this report with effective vaccines to prevent infections, including pneumococcal conjugate vaccines (PCVs). The PCV13 vaccine, which the U.S. Food and Drug Administration (FDA) licensed in 2010, protects people from 13 types of pneumococcus, including resistant forms. This vaccine prevented more than 30,000 cases of invasive pneumococcal disease and 3,000 deaths from 2010 to 2013 alone.<sup>19</sup>

Importantly, the PCV13 vaccine also prolonged the efficacy of the oldest antimicrobial—penicillin—by preventing more resistant forms of pneumococcus.

In 2021, two new pneumococcal conjugate vaccines were licensed for adults—PCV15 and PCV20. With additional serotypes included in these vaccines, even more cases of pneumococcal disease should be prevented.

Research on novel products, like decolonizing agents, can also help reduce the impact of antimicrobial resistance. Some people carry antimicrobial-resistant pathogens in the nose, skin, lungs, or digestive tract without becoming sick or showing symptoms, known as colonization. These germs can eventually cause an infection or people can spread these germs to others.

The CARB National Action Plan supports innovative approaches to developing and deploying diagnostic tests and treatment strategies. Limited return on investment for new diagnostics is also a significant challenge, and the development pathways for some non-antibiotic/antifungal therapeutics remain uncharted.

The COVID-19 pandemic highlighted the importance of prevention. Treatment after an infection occurs is not the only solution and should not be the only option. We need more prevention products, not just new drugs, to stop infections before they happen.

### Decolonization is a Great ROI

People can carry resistant germs without symptoms of infection. CDC has invested in decolonization research and testing through CDC's AR Lab Network to stop the silent spread of these dangerous pathogens.



During the pandemic, CDC and the University of California, Irvine leveraged an existing regional public health collaborative with 40 healthcare facilities, including hospitals, long term-acute care hospitals, and nursing homes to conduct COVID-19 outreach to 70 Orange County nursing homes.



Facilities stopped the spread of COVID-19 by using enhanced infection prevention trainings paired with decolonization methods.<sup>20</sup> Staff continue to receive training and are monitoring for additional spread.



New decolonization agents are needed to make colonized patients less infectious and slow the spread and development of antimicrobial resistance.



# INVESTING IN INNOVATION, 2016-2020



The United States has been building a solid foundation for public health preparedness to address antimicrobial resistance. Since 2016, CDC has funded more than 300 projects and collaborated with more than 100 public and private institutions.<sup>21</sup> Data from these projects help CDC better protect people by uncovering places resistant germs live and spread, improving outbreak response, and strengthening infection prevention and control practices. The United States must continue exploring and using innovative solutions to address the gaps identified in combating antimicrobial resistance, which will also prepare the country for new emerging threats.

Since 2016, CDC has invested more than \$160 million in research to address knowledge gaps with scalable, innovative solutions such as vaccines, therapeutics, diagnostics and other prevention tools.



## What's Next: CDC is exploring investments in the U.S. public health infrastructure to better respond to the challenges of antimicrobial resistance and emerging threats simultaneously.

- Supporting more innovation and research on therapeutics, vaccines, and diagnostics.
- Enhancing interagency collaborations to accelerate research for developing new antibiotics, antifungals, therapeutics, and vaccines, including working with FDA to identify ways to support decolonization products.
- Working to undo negative impacts the COVID-19 pandemic may have had on essential vaccine conversations.
- Supporting the widespread use of vaccines to prevent infections, slow the spread of resistance, and reduce antibiotic use.
- Building a vaccine data platform to inform and accelerate the development of new vaccines, stopping infections before they start, as part of the CARB National Action Plan.



U.S. Department of Health and Human Services  
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Learn more: [www.cdc.gov/drugresistance/covid19.html](http://www.cdc.gov/drugresistance/covid19.html)